

GGCGGACTTAGGAAAGGGCGTCGGCTAGCAGCTGTGGCCGCCGGCGGTGGGACTCCAAGCACCC
 TTGACCCCTGGCGCAGGCAGGCGCGTGCACGCTTACAGGTGCCGCCAGGATGGACGTGCCAGCC
 CCGTTGGCGAGAAGGAGGAGGGCCGTGCGCCAGCAGCTGTGGCTCCAGGCCCGCAGGATGGACGTGCCAGCC
 AGGGTGTCAGACGAGCGCGGCCAGGATGCTGTGCGTACTGCCGCCCTCGCGAGTG
 CTGGTCTCTGCCGACCGCGCTGCTCTGCCCTACGGCTTCTCGCAAACCTCCGGCGTCGGAGCCGTTCC
 TCACGCCCTACCTCTGGGACCCGACAAGAACTTGACCGAGAGACAGGTCTACAATGAAATTATCCGGTG
 TGGACGTACTCTTACCTGCTGCTGTTCCCGTCTTGCCACAGACTACCTCCGGTACAAGCCTGT
 CATCCTGCTGCAGGGACTCAGCCTGATTGTGACGTGGTCTGCTGCTCATGCCAGGGACTGCTGGCCA
 TTCAGTTCTTGAATTCTCTACGGCATGCCACAGCCACCAGAAATGCCACTACTCCTATATCTATACT
 GTGGTGGACCTGGGATGACAGAAAGTCACAAGCTACTGTAGAAGTGCACCTGGTGGGCTTACAGT
 GGGCTCCGCTCTAGGGCAGATCCTCGTCTCCGTGGTGGGCTGGTCACTGTCAGCTGAACGTCACTCCCC
 TCACCTGTGTTCTGTGGCTTTGCTGTCGGCTGGTCTGCCATGCCACAGAACAGCCTCTTTCAC
 CACATTCCCTCTGTGTCATGGAGTGAACGGCCTCAAGGTACAAAACGGTGGCATCGTTACTGATAACCCC
 AGCAGCTAACCATCTCCTGGATGGGAGGACATTGAGTCAAAATCCCTAAATTAGATGAGCCTCCGG
 TGGAAAGAACCGGAGGGAGCCAAAGCCAGACCGGCTGCCGGTGTTCAGAGTCTGTGGAAATGACTTCTGATG
 TGTTATTCTCCGCCCTGCTCTGTGGTCTGTGGTCTGTCAGGCTCTGGGCTATTCCAAGT
 GGTGAACTACGCGCAGGGATTGTGGAGAAGGTGATGCCCTCTCAGAATGCTGACATCTACAATGGCGGTG
 TGGAGGCCGTTCAACCTGCTGGGTGCTAGTGTGTTGCAAGTGGCTATATAAGCTATCTGGTCA
 ACTTGGGAGAAATGACGTTGTCCTGTGTTCTCCTGATTGCTGCTGCAGTGATGTCTGACACTGT
 GCAGAGCATCTGGGTGTGCTATGCATCCTATGTTGCTTCAGAATCATCTACATGGTACTCATCACCAG
 CAACTTCCAGATTGCTGCGAACCTCAGCATGGAACGTTACGCCCTGTGTTGGCTGAAACACCTCATT
 GCCCTGGCATTGCACTCTGCTCACTCTGATTGCTGGATGCCAGGGGCTTGGCTTATGTATCACAC
 TCAGTTCTGATTACGCCAGTTACTTCGCAAGCCATCTCTGTTGCTTCTGGCAATGGCATAGTCAGTA
 TTATAAAGAAATGCAAGAAAGCAGGAAGATCCCAGCTCCAGCCCCAAGCCTCCACGCTTAACGGCTCCC
 GAAGTGCTGCTGCTTCAAGCAAGGATTGCAACCGCAGCTGCTGGATGTATTAAACTCCTCATGGTCA
 AGATAGCTATTCTGAATGTATATTGATGGCTTCAAGCAGCTACTCAACTAACACCTGCACTTGG
 GTTAGTATAAACTGCTAAGAGAACGGGAAGCTTTCTGGATTGCTTATGAGCAGTAATTAAAGA
 AAACCCACAAAACCTGATTGTGAAAAACCGAATAACCAAGCAGCGCTGCTCTTCCCTGATTGCA
 TGACTGTGATGCTTCCAGTCACATTGATCACGCACACTCAGACCTGTGGCTGGGACCAGGGCTTCAGG
 AGCCACAGGATGGTACAAGCCTCGACAGACACGTTCTGTCAGCACTGCCCGGCCACCTCATTCTGGTT
 CAGTGTACTTGTGCGATGTGTGTGTCTGCAAGATGAAATCATTCCCACTGGCAGTATCTGCTCG
 GGTCACGCTCTGCTCTGAGGAGTGTGTGCTGATTGTTATTAAAGTTCAACGGTATGAGAGTTAG
 TGCTCTCCCAATTGACCGTTGATATTGAAACGTTCTTAACTACATTCTGCATTATTGTA
 TGCTCTCCAGAGAAGCTCATTGATACAAAGGCACATTAAAGCCTGCTGATAACTGAGGAGGGCTAA
 TGAGATAGGTTGCTGCTGTAATAGTTATGAGCAGGACTCTTAATTGCAACTGAAAGGTCGTGAT
 AGGTTAGAGATAACAGGGAGCCCATTATTGATACCCATTATTCCAAAACAAATGAGCTTT
 CCCTTGAGACAATATCATTCCATACCTCTCATTGCTTGGCTTCTTATCCAAGACGAGAAGATATCA
 GTCGGAACGGATTATTCCACAGCCTTTTATAAAACTGAGCCTCTTAAATGATTGTTCTGGCTTGGCA
 GTAGGATAGACTTGATGCCCTGCGTTGGACCTAGACCTGCCGCCCTGCTTCAAGTTAGATCATCT
 TGAGAGATACTTAAAGTATCTCCTCTTACTTGAAAGAATGATGTTCTACATGCTAATATTGTGAGACA
 TGAAAATATTCAAAGCCAACCTTGTGTCTGTTGATAAGAAATCTAGGTAGGGCTTCAACTAGAG
 TGTTGACCTTGTAAAGACGGACGTAGCTGCACTGGTATTCTCAAAACTGAGATTGCAAAACTGAAGCTTGAC
 AAGTGTGTTGAAAGACCTGGCTCAAGTTCCAGCACTGGAAAGACCAAAGTGCACACGTGCATGGGAGGAGT
 GAGGGTAACAGAGGCCATGGCGTACGTCTCCTTGCAGCTAGGGAAAGAGAAGAACACTAAGGAGATGGA
 GAACTAAGGTCAAGAGTAGCAGTCTCCAGTCTTACATTGCTTCTTCTTCTTAACTTCCCTGCTC
 TATAAGAAGTTGGTGTGCCAGAAACAAGAAGAAACATTGTGATTGCAAGTGTCTTGTGTTTTTTA
 AATAACATGTTATTGACAAATCAAATTGTCACATTACCAAAGCAATTTCCTGGATTGAGTTCA
 TGTTGTCAGTCAATCTGATCCTTACGTGCTAAATCAAGACTGTATCCACATTACACGCGG
 CCATACTTGCAGAATGCAGACCTAGTGGCTGTACTGTATGCACTTGTGATGAAAGACGTGAAAAGAATCTG
 CTGTAATTATTCAATCTGATAGACTATAAAACTATTATTAAATAATTACAGTAAAAAA
 AAAA (SEQ ID NO:1)

FIGURE 1

MDVPARVSRRAAAAARMLLRTARVPRECWFPLPTALLCAYGFFANLRPSEPFLTPYLLG
PDKNLTERQVYNEIYPVWTYSYLLLLFPVFLATDYLRYKPVILLQGLSLIVTWFMLLYA
QGLLAIQFLEFFYGIATAEIAYYSYIYTUVVDLGMYQKVTSYCRSATLVGFTVGSVLGQ
ILVSVVGVWSLFSLNVI SLTCVSVAFAVAWFLPMPQKSLFFHHIPSSCHGVNGLKVQNGG
IVTDTPAANHLPGWEDIESKIPLNLDDEPPVEEPEEPKPDRRLRVFRVLWNDFLMCYSSRP
LLCWSVWWALSTCGYFQVVNYAQGLWEKVMPSQNADIYNGGVEAVSTLLGASAVFAVGY
IKLSWSTWGEMTLFLCSLLIAAAVYVMDTVQSIWVCYASYVVFRIIYMVLITIATFQIA
ANLSMERYALVFGVNTFI ALALQTLTLIVVDARGLGLCITTQFLIYASYFAAISVVFL
ANGIVSIIKKCRKQEDPSSSPQASTS (SEQ ID NO: 2)

FIGURE 2

Sequence Length: 3554 bp

Sequence Deleted: from base 484 to base 526

b Id underlined text = deleted in gene sequence

plain text = gene sequence flanking deleted sequence

GGCGGACTTAGGGAAAGGGCGTTCGGCTAGCGAGCTGTGGCCGCCGGCGGTGGGACTCCAAGCACCTGACCTG
GCAGCAGGGCGCGTCCGCACGCTTACAGGTGCCCCGCGCGGGCTCGCGCTGGCGCCCTCCGTTGGCCGAGAAGGAG
GAGGGGGGCGTGTGCGCGTCCAGGCCCTCGGCCAGGATGGACGTGGCCAGCAGGGTGTCCAGACGAGCGGCCGGCG
GCGGCCAGGATGCTTCTGCGTACTGCCGCCGCTCCCTCGGAGCTGCTGGTCTCGCCAGCGCTGCTCTGCCCTACGG
CTTCTCGAACACCTCCGGCGTGGAGCGCTCAGGCCCTACCTCTGGGACCCGACAAGAACTTGACCGAGAGAC
AGGTCTACATGAAATTATCGGTGTGGACGGTACTCTAACCTGCTGCTGCTGTTCCCGTGTCCCTGCAACAGACTAC
CTCCGGTACAAGCCTGTCATCTGCTGCAAGGACTCAGCTGATTTGACGTGGTTCATGCTGCTTATGCCAGGGACT
GCTGGCCATTCAAGTCTTGGAAATTCTTACCGCATGCCACAGCCACCGAAATGCCCTACTACTCTTATATCTATACTG
TGGTGGACCTGGCATGTACAGAAAAGTCACAAGCTACTGTAGAAGTGCCACCTTGGTGGGTTTACAGTGGCTCCGTC
CTAGGGCAGATCTCGTCCCGTGGTGGCTGGTCACTGTTACGCTGAACGTACACCTGACCTGTGTTCTGTC
TTTGTGCTGTCGGCTGGTTCTGCCATGCCACAGAGGCCCTCTGCTTACACATTCCCTCTCTGTATGGAGTGA
ACGGCCTCAAGGTACAAAACGGTGGCATCGTACTGATAACCCAGCAGCTAACCATCTCTGTGATGGAGGACATTGAG
TCAAAAATCCCCTAAATTAGATGAGCCTCCGGTGGAAAGACGGGAGGAGCCAGACGGCTGCGGGTGTCCACCT
AGTCTGTGGATGACTTCTGATGTGTTATCTCCCGCCCTGCTCTGCTGGTGGGTTACAGTGGATGCTTCTCAGAATGCT
GGGGCTATTCCAAGTGGTAACACTACGGCAGGGATTGTGGAGAAGGTGATGCCCTCTCAGAATGCTGACATCTACAAT
GGCGGTGTGGAGGCCGTTCAACCTTGTGGGCTAGTGTGTTGCACTGGCTATATAAGCTATCTGGTCAAC
TTGGGGAGAAATGACGTTGTCCTGTGTTCTCCTGATTGCTGCTGCACTGTATGTCATGGACACTGTGCAAGACATCT
GGGTGTGCTATGCATCTATGTTGCTCTCAGAACATCATCACATGGTACTCATCACCATAGCAACTTCCAGATTGCTGCG
AACCTCAGCATGGAACGTTACGCCCTTGTGTTGGCTGAACACCTTCACTGGCATTGCGAGACTCTGCTCACTCT
GATTGTCGTGGATGCCAGGGCTTGGCTTATGTTACCAACTCAGTCTGATTACGGCAGTTACTCGCAGCCATCT
CTGTTGTTCTGGCATAGTCAGTATTAAAGAAATGCAAGAAGCAGGAGATCCCAGCTCCAGCCCCCAA
GCCTCCACGCTCTAACGGCTCCGGTGGCTGCTTCCAAGCAAGGATTTCAGCAGCTGCTGGATGTAATTAA
AACTCCTCATGGTCAGATAGCTATTCTGAATGTATATTCACTGGCTCAAAGCAGCTACTCAACTAACACCTTGCAGT
CTTGGAGTTAGTATAAATCTGCTAACAGAACGGGAAGCTTTTTCTGGATTGCTTATGAGCAGTAATTAAAGAAAA
CCCACAAAATGATTGTGAAAAACCGAATAACCAAGCAGCGCGTCTGCTCTTCCCTGATTCCATGTGACTGTGATGC
TTCCAGTCACATTCACTACGCACCTCAGACCTGTGGCTGGCAGGGCTTCAAGGACACAGGATGGTACAAGCC
TCGACAGACACGTTCTGTCAGCAGCTTGGCCGCCACCTCATTCTGGTTTCACTGGTACTGTGCGCATGTGTTG
TCTGCAGATGGAAATCATTCCCATGGCAGTATCTGCTGGGTTCAACGCTCTGCTTCAAGGAGTGTGTTGCTGAT
TTTATTTAAAGTCACGGTATGAGAGTTAGTGTCTCTCCCAATTGACCGTTGATATTGGAAACGTTCTTAG
AATACATTCTGCATTATTGTATGCTTCCAGAACGCTCAATTCAAAAGGCACATTAAAGCTGCTGATAA
CTGAGGAGGGCTAATGAGATAGGTTGCTGCTGTAATAGTTGATGAAGGACTCTTAATTGCAACTGAAAAGGTG
TGTATAGGTTAGAGATAACAGGGAGCCATTATATTGCAACCTTTATTCCAAAACAAAATGAGCTTTTCCCT
TGAGACAATATCATTCCCATACCTCTCATTGCTTGGCTTATCCAAGACGAGAAGATATCAGTCGAACGGAT
TATTCCACAGCCTTTTATAAAACTGAGCCTCTCTTAACTGATTGTTCTGGCTTGGCAGTAGGATAGACCTTGTGATGCTG
GTTTGGACCTTAGACCTGGCCGCTCTGTTCTACAGTTAGATCATCTTGAGAGATACTTAAAGTATCTCCCTTAC
TTGAAAGAAGATGTTCTACATGCTAATTGAGACATGAAAATATTCAAGGCAACTTGTGTTGCTTGTGTTGAT
AAGAAATCTAGGTAGGTGCTTCACTAGATGTTGACCTTGTAAAGACGGAGCTGCTGACGGTATTCTCAAACTG
GATTGCAAAACTGAAGCTTGAACAGTGTGGAAGACCCCTGGCTCAAGTCCAGCACTGGAAAGACCAAGTGCAAACGT
GCATGGGAGGGAGTGAGGGTAACAGAGGCCATGGCGTACGTCTTCCCTTGCACTAGGGAAAGAGAAGAACACTAAGGAGA
TGGAGAACAAGTCAGAGTAGCAGTCTCCAGTCTACATTGGTCTTCTCTTACTACTTCCCTTATGCTCTATAA
GAAGTTGGTTGCCAGAAACAGAAGAAACATTGTAATGCGAAGTGTCAATTGTTGTTTAAATAACATGTATTA
TGGCACAATCAAATTGTCACATTACCAAGAACATTCTTGGGATTCACTGGTCACTGTTGTCAGTGTGCTTGTGCT
CTTCTTACGTGCTAAATCAAGACTGTATCCACATTACCGCGGCCATACTGCAAGATGCGAGACCCCTAGTGGGCT
GTACTGTATGCACTTGTGACTGAAAGACGTGAAAAGAATCTGCTGACTTTTATTCAATCTGTATAGACTATAAAACTATT
TTATTAAATAATATTACAGTAAAAAAAAAA
(SEQ ID NO:1)

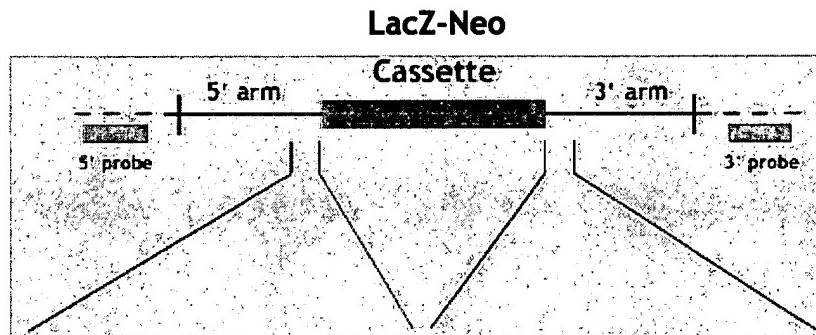
FIGURE 3

Targeting Vector* (genomic sequence)

Arm Length:

5': 4.5 kb

3': 1.5 kb



Targeting Vector

Endogenous Locus

*** Not drawn to scale**

5' >TTACTGTGGCAGTATTCTCGGGATAAGGGAGTGTGGTGGGGCTGTTTGAGGAATACATTCTTA
TGGCTTGTCGGGCTGTGATCACAAACGAGCTTCACTCTCCCTACCGAGTCTACAATGAAATTATCCGGTGTGGACGTACTCTTACCTGCTGCTGCTGTTCCCGTGTCCCTGCCACAGACTACCTC<3'
(SEQ ID NO: 3)

5' >TGACGTGGTTCATGCTGCTCT
ATGCCAGGGACTGCTGGCCATTCA
AGTTCTTGAATTCTTCTACGGCA
TCGCCACAGCCACCGAAATGCCCT
ACTACTCCTATATCTATACTGTGG
TGGACCTGGGCATGTACCAAGAAAG
TCACAAGCTACTGTAGAAGTCCCA
CCTTGGTGGGCTTACAGTGGCTT
CCGTCCCTAGGG<3'
(SEQ ID NO:4)

FIGURE 4

Phenotypic Data Summary - Necropsy Weights

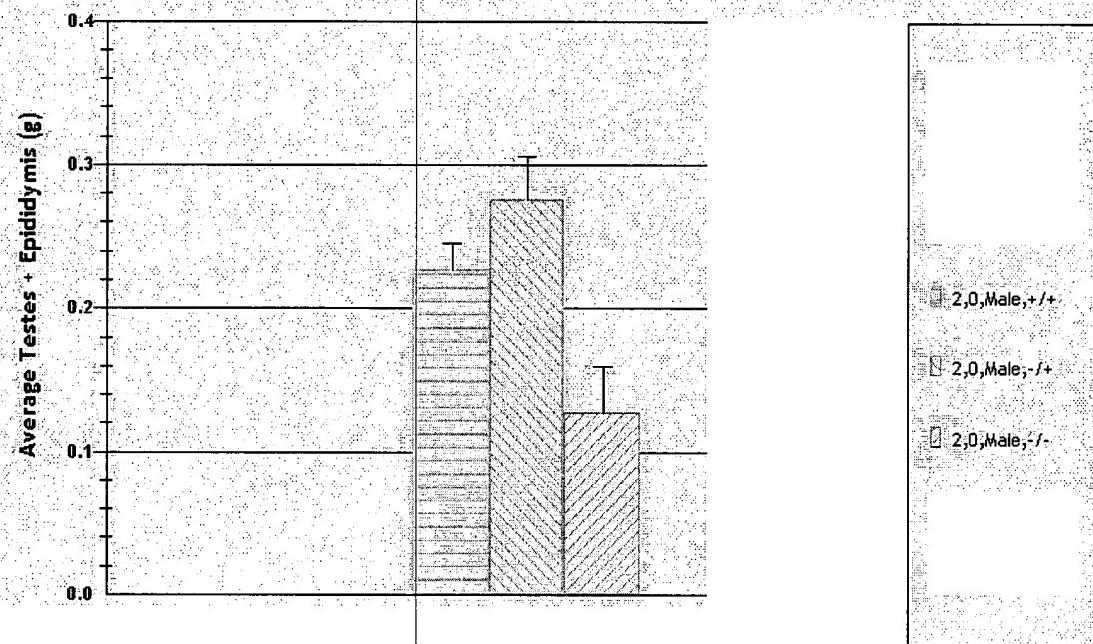


FIGURE 5

Phenotypic Data Summary - Necropsy Weights

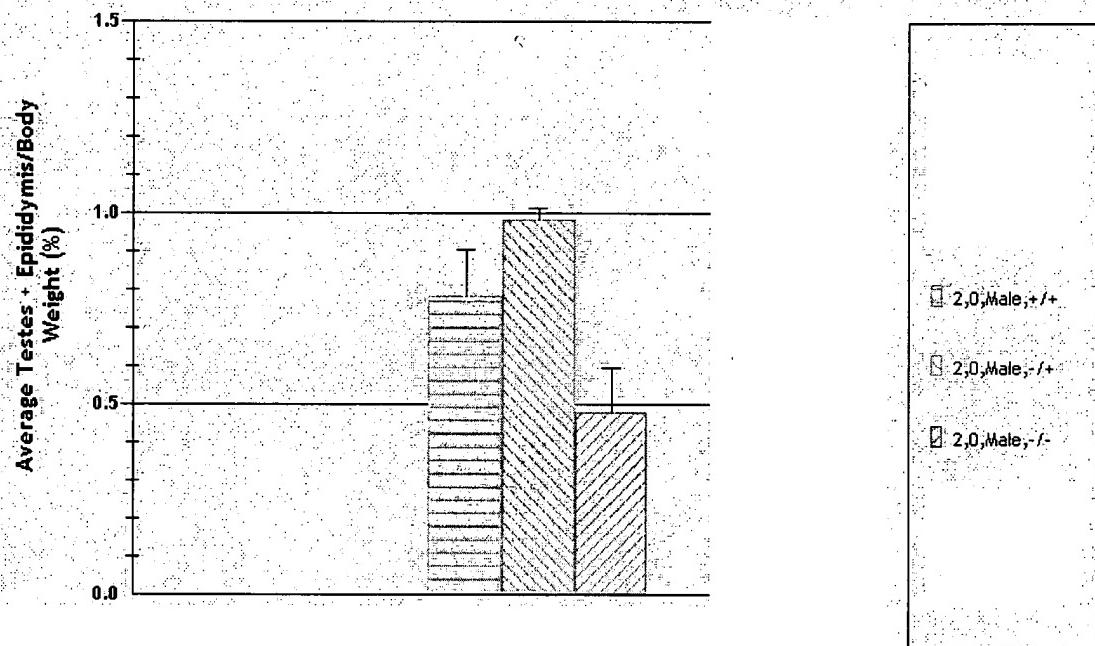


FIGURE 6